

THE REDISCOVERY OF CHORIPLAX (= MICROPLAX) GRAYI,  
ADAMS AND ANGAS (ORDER POLYPLACOPHORA, WITH  
NOTES ON ITS TRUE PLACE IN THE NATURAL SYSTEM  
AND THE DESCRIPTION OF A NEW SUB-SPECIES.

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PLATE IX.

*Microplax grayi*, H. Ad. and Ang., P.Z.S., 1864, p. 194;  
*l.c.*, 1865, p. 58, t. 11, f. 16. Angas, P.Z.S., 1867, p. 224.  
Carpenter, MS., p. 12. Pilsbry, Man. of Con., vol. xiv., p. 21.

*Choriplax grayi*, H. Ad. and Ang. Pilsbry, Nautilus, vii.,  
p. 139, 1894. Thiele, Rev. des Sys. der Chitonen. Zool., iv., 1910.

It is with pleasure that I acknowledge my indebtedness to Dr. W. G. Torr for the opportunity of examining and describing one of the most interesting chitons it has been my privilege to examine. On May 7 last I received from him a few chitons for identification, all taken by Mr. George Pattison, near Cape Banks Lighthouse. One, he said, was not only a species new to him, but also belonged to a genus he had never seen before. I saw at once that the specimen was a remarkable find, evidently related to the genus *Amicula*, a genus whose habitat is in the cold waters of the North Pacific, from the Okhotsk Sea to the Behring Sea, and in corresponding latitudes on the eastern side of the North American continent.

Genus *Microplax*, Adams and Angas, 1864. Original description:—"Insertion plates smooth and thin, present in all the valves. Sutural plates obsolete, the sinus extremely shallow. Girdle thin, horny, most minutely granulous. Valves largely concealed in the girdle, the exposed portions small and separated.

"In the present genus a small portion only of each valve is exposed, and the sutural plates and sinus are obsolete. No other chiton having unslit insertion plates approaches this remarkable group."

*M. grayi*, Adams and Angas. Original description:—"Shell elongated, convex, brown; exposed portion of the valves minute, wide heart-shaped, carinated, strongly granulated, the intervals between the exposed parts of the valves about as long as the latter. Lateral areas defined by a distinct rib. Girdle moderate, corneous, smooth. Length, 13; width, 5 mill. Sydney Harbour, Australia; under stones at low water."

## CHORIPLAX GRAYI PATTISONI, n. sub-sp.

Differs from *C. grayi*, Ad. and Ang., in its greater width and in the fact that the tegmentum is proportionately smaller. The measurements of *C. grayi*, s.s., are quoted by Pilsbry (*l.c.*, pp. 21, 22), are: length, 13; width, 5 mm. Tegmentum,  $1\frac{1}{2} \times 1\frac{3}{4}$  mm. Whereas the measurements of the present specimen are  $18 \times 8\frac{1}{2}$  mm., and the tegmentum  $1\frac{1}{2} \times 1$  mm.

An examination of the drawings made by E. A. Smith and figured by Pilsbry (*l.c.*, pl., figs 9-11) will further explain these differences.

*General Appearance*.—Broadly oval, the posterior valve being much larger than the anterior. The tegmentum reduced to a small, heart-shaped, raised portion at the apex of each valve, this portion being pink. The balance of the shell is olive-green, due to an extension of the epidermal layer of the girdle over the whole of each valve, with the exception of the small, raised, heart-shaped tegmentum before referred to. The epidermal skin is minutely granulose, semi-transparent, and free from scales, hairs, or spicules.

*Colour*.—The small, heart-shaped, exposed portions (or tegmentum) are Prussian Red with flecking of Ochre Red (Ridgway's Colour Standards, pl. xxvii.). The epidermal covering of the highly developed articulamentum portions of the shell is, in a good light, olive-lake, merging into Saccardo's olive, in the shaded or overlapping portions of the sutural laminae (*l.c.*, pl. xxix.). The girdle is warm sepia, or a little darker.

*Inside of Shell*.—Transparent, pearly, and very highly polished. The plates are so thin and delicate that none of them are quite unbroken on the interior margins. The anterior margin of the sutural laminae is almost straight, the suture is reduced to a mere inward bend imperceptible in several of the valves.

*Anterior Valve*.—The small exposed portion is semi-circular; the apex, which in this species corresponds with the mucro of the tail valve, is pronounced and approximately smooth, the superficial layer semitransparent, showing subcutaneous dark and light streaks radiating from the mucro. These may easily be mistaken for grooves and ridges. This smooth area is produced anteriorly for fully one-third of the width of the tegmentum. The balance of the valve is sculptured with rather widely spaced granules. There seems no consistent arrangement of these. The mucro is anterior to the posterior margin of the tegmentum, and the posterior lobes of the articulamentum unite behind same.

*Median Valves*.—The small exposed tegmentum is heart-shaped, posterior margin curved, in some straight,

furnished with a broad beak or mucro, the tegmentum being continued behind this. The dorsal area is distinct and broad with almost parallel sides. The portion immediately in front of the mucro is usually coarsely longitudinally ribbed, more or less broken. In some of the valves these ribs continue to the anterior margin, in others they are replaced by subcutaneous lining. In this anterior portion, irregular raised pustules also occur to a limited extent in some of the valves. Although these irregularities exist, the chief character of this part of the shell is strong, longitudinal ribbing. A strongly-raised, diagonal rib commences at the mucro and dies away about half-way across the tegmentum dividing the lateral from the pleural area. The pleural area is sculptured with irregularly-shaped, rough-looking pustules. There is a tendency for these to become confluent along lines parallel with the ribbing in the dorsal area. In the lateral areas the raised portions or granules are even more irregular in shape than is the case in the pleural area. Behind the mucro and diagonal rib the subcutaneous line-marking is radial, and very marked in some valves. As before stated, the mucro is anterior to the posterior margin, and the posterior lobes of the insertion plates unite behind the tegmentum.

*Posterior Valve.*—The anterior portion of the tegmentum is less pointed than is the case in the median valves, the posterior part semicircular. Mucro anterior, a number of dark subcutaneous streaks radiate from the mucro posteriorly in a fan, with a highly-polished, semitransparent surface, but it is not truly smooth; this character occupies about one-quarter of the length of the tegmentum and is fan-shaped. That part of the valve behind the mucro is sculptured fairly evenly with circular pustules placed more or less concentrically. The anterior portion is longitudinally ribbed, but, in addition, there are coarse irregular pustules. This valve is large, measuring  $4 \times 7$  mm., the tegmentum placed centrally.

*Girdle.*—In the dry specimen is wrinkled, bearing neither scales, hairs, or spicules; has a gelatinous or horny look, is dark in colour, and, with shrinking, has curved inside the shell to a width of .75 mm. The girdle is thickened over the marginal portion of the insertion plates, forming a dark band round the shell 1 mm. in width or with the incurved portion referred to a total girdle width, in dry specimens, of 1.75 mm.

*Measurements.*—Length,  $18 \times 8\frac{1}{2}$  mm. The tegmentum, or exposed part, reaches a maximum width of  $1\frac{1}{2}$  mm. by 1 mm. longitudinally, in one of the median valves, whereas the articulamentum in valve 6 is 3 mm., longitudinally, by 8 mm. in width.

*Habitat.*—The specimen under review was found near Cape Banks Lighthouse, in South Australia. The following

are Mr. Pattison's own words:—"A heavy sea tore off the big kelp (*Laminaria*) outside the reef and washed it up on the beach. The chiton was amongst the kelp, on the beach, and the sea lice had probably eaten the fish out." These facts and the flat, fragile character of the shell, with its green-brown, transparent, epidermal covering, suggest the probability of its living on the stems of the kelp under which it was found. While the discovery of the host plant of the genus *Stenochiton*, as described in my monograph (Trans. Roy. Soc. S. Austr., vol. xlii., 1918), has led to their discovery in some of the other States, is it not quite feasible that a similar search on the stems of some forms of algae may reveal a race of Polyplacophora living thereon.

*Remarks.*—This remarkable shell presents many unique features, the extremely reduced area of the tegmentum, the modified character of the sutural laminae, the exceptional development of the insertion plates, the partial or entire absence of slits, the transparent granula epidermal covering, and the peculiar posterior lobing of the insertion plates, widely separates this from any other known form in Australian waters, and, I believe, no near ally has up to the present been discovered in the Southern Hemisphere. Perhaps the nearest relative in our southern seas is the New Zealand shell, *Cryptoconchus porosus*, Burrow; but that species cannot be said to be very closely allied, as it only possesses a few characters in common. I have quoted the original description of both genus and species as published by Dr. Pilsbry in his famous Monograph. In the main my description, which has been written without any special reference to the earlier writers, will be found very closely to correspond therewith, but there are some rather important differences. In the first place, the sutural laminae are by no means obsolete, as stated by Adams and Angas, and there is considerably more overlapping of the valves than was noticed by Carpenter, the laminae, in some valves, reaching fully two-thirds across the tegmentum. The insertion plates are abnormally developed; in fact, this species seems to have specialized in this form of development, and, in some measure, adapted the character of the tail valve to the median valves. The lateral insertion plates are joined behind the tegmentum and produced, posteriorly, in two lobes with a sinus between them, a feature that is present in a very modified form in the tail valve of some of the Acanthochitons. While in the undissected shell under examination I cannot detect any slits in any of the insertion plates, I cannot say that they do not exist in a modified form. The interior of the tail valve is radially grooved and scored, until the girdle is approached,

when the grooves appear to terminate. I would suggest the probability that in the juvenile stage some evidence of slits may exist and disappear in the mature or senile form.

*Classification.*—While it is to be greatly regretted that the animal and radula are missing, and also that permission has not been obtained to disarticulate some of the valves, the transparency of the shell has made this latter less important than is usually the case, I have been able to note sufficient features to justify one in removing the genus *Choriplax* (= *Microplax*) out of its setting in our previous classification. I can see no justification for placing a species with abnormally developed insertion plates under the Lepidopleuridae. Had the animal been present and the valves disarticulated, there would have been but little difficulty in finding its true place in the Natural System or Taxis. In spite of these limitations, the characters that it has been possible to observe are sufficient to warrant our placing the genus *Choriplax*, Pils., near the genus *Amicula*, Gray. For reasons given hereunder I should place it between *Amicula* and the Subfamily *Cryptochitoninae*. The characters of the genus *Amicula*, Gray, are given by Pilsbry (in Man. Con., vol. xv., p. 43) as “Valves almost covered by the extension of the girdle over them, leaving only a small, rounded, or heart-shaped portion exposed at the apex of each; posterior borders of valves produced backwards in rounded lobes at each side, the lobes completely separated by a posterior sinus having the tegmentum at its apex. Posterior valve having a posterior sinus and one slit on each side. Girdle more or less pilose, often having pore rows. The essential features of *Amicula* are its small exposed portion or tegmentum, situated at the posterior edge, and not extending forward to the sinus, its mopaloid posterior valve, short contour, and short gills.”

The species under consideration corresponds with *Amicula* in some of its most striking features, but, although like the *Amicula*, the tegmentum does not extend forward to the sinus; unlike that genus it does not extend to the posterior margin, neither have we noticed any slit, nor is the girdle pilose.

The description of the *Cryptochitoninae*, in the same work, p. 48, is: “Valves entirely concealed in the leathery girdle and lacking tegmentum; their posterior margin produced backwards in a deep lobe on each side, the lobes united across the median line, causing the apices of all valves to be removed inwards from the posterior edge, slits sub-obsolete or lacking in the intermediate valves, girdle covered with minute tufts or bristles.” It will be noticed that two of the distinguishing features of the *Cryptochitoninae* are present in

*Choriplax* but absent in *Amicula*, namely, the sub-obsolete or lacking slits, in the median valves and the posterior lobes of the articulamentum uniting across the median line, causing the apices of all valves to be removed inwards from the posterior edge.

While Dr. J. Thiele (Rev. des Sys. der Chitonen, pt. ii., pp. 106 and 116) leaves the genus *Choriplax* under the Lepidopleuridae between *Hanleya*, Gray, and *Oldroydia*, Dall, did so evidently with considerable misgivings. I cannot follow him in placing the two genera *Katharina*, Gray, and *Amicula*, Gray, under the Mopaliidae, and think Pilsbry is right in placing them immediately before the genus *Cryptochiton*. I would also suggest the recognition of the genus *Cryptoconchus*, Blain. and Guilding, with *C. porosus*, Burrow, as type, and placing it between *Loboplax*, Pils., and *Katharina*, Gray. With its striking development of the articulamentum posteriorly, in two lobes, its reduced tegmentum, and pores often sub-obsolete, it seems a sort of "half-way house" between those genera.

*Finally.*—I propose that the genus *Choriplax*, Pils., be taken out of its previous setting amongst the less specialized group, the Lepidopleuridae, and be placed under the Family Acanthochitidae, Pils., following the genus *Amicula*, Gray, and preceding the genus *Cryptochiton*, Midd. and Gray. The apparent absence of slits in the insertion plates is, I suggest, probably due to modifications in a very specialized form, brought about by the peculiar habits of the chiton. The same tendency is already apparent in the genus *Cryptochiton* where the slits in the median valves have either been lost entirely or become sub-obsolete.

*Revised definition of the Genus Choriplax, Pils.*—Valves are almost covered by the extension of the girdle over them, the tegmentum or exposed part being reduced to a small, heart-shaped portion, exposed at the apex of each; the insertion plates highly developed, smooth and thin, extending posteriorly in a deep lobe on each side, the lobes united across the median line, causing the apices of all valves to be removed inward from the posterior edge. The sutural laminae are apparently shallow, united across the median line, and the sinus reduced thereby to a mere inward bend. Girdle thin, horny, minutely granulose.

If we are justified in placing the genus *Cryptochiton* under the Subfamily Cryptochitoninae, may we not be justified in doing likewise for this remarkable genus, retaining Adams and Angus' name under the name of a subfamily called Microplaxinae with *Choriplax grayi*, Ad. and Ang., as the type, taking the foregoing description as the definition of the subfamily, with the addition of any new features the later

examination of the soft parts may reveal? So naturally does this genus seem to fit into the place I have assigned to it, that the wiser course might possibly be to place both *Choriplax* and *Cryptochiton* under the Family Acanthochitidae, Pils., and drop the Subfamily Cryptochitoninae.

NOTE.—In the writer's last paper on Australian Polyplacophora (Trans. Roy. Soc. S. Austr., vol. xlv., p. 286, 1920) reference is made to the race of *Callistochiton meridionalis*, Ashby, which had been previously described from a single specimen from North-west Tasmania, and to which he had attached the name of *mayi*. Since this was written several specimens from the same district have come to hand, and while some show the same backward habit of developing the typical network sculpture that was noted in the paper referred to, other specimens are almost normal. Had more material been available at the time the then unique specimen was described, the writer would have contented himself with simply noting the fact that shells from this North-west Tasmanian coast attain the adult characters more slowly than is the case with those from the type locality in South Australia. In the same paper, p. 283, *Lepidopleurus inquinatus*, should be of Reeve, and not Blainville, as printed, and *L. catenatus*, Hed. and Hull, should have been withdrawn from the Australian fauna, it being a Lord Howe Island species.

ADDENDUM.—Since presenting the foregoing paper I have had the opportunity of reading in the Nautilus, vii., p. 139, Dr. Pilsbry's note attached to his proposed substitution of the name *Choriplax* for that of *Microplax*, which name was preoccupied, and I now quote his remarks in full:—"This is an extremely peculiar and isolated genus, and forming, I am disposed to believe, a distinct family of the Eoplacophora, or slitless chitons; that is, if the slits really prove to be completely absent, for the unique type has not been disarticulated. In some features it recalls the Acanthochitidae. The single specimen was described and illustrated from the unique type in the British Museum, in the Manual of Conchology, vol. xiv."

#### DESCRIPTION OF PLATE IX.

- Fig. 1a. *Choriplax grayi pattisoni*, Ashby, upper side,  $\times$  about 5. Showing small heart-shape tegmentum and enveloping epidermis with tear in valve 2 revealing smooth articulation underneath.
- Fig. 1b. *Choriplax grayi pattisoni*, Ashby, interior of shell,  $\times$  5. Showing sutural laminae.
- Fig. 1c. *Choriplax grayi pattisoni*, Ashby, upper side with strong light thrown through the shell showing (a) shadow of sutural laminae, (b) opacity of tegmentum, (c) the posterior lobes united across the median line,  $\times$  5.